भारतीय मानक

Indian Standard

IS 7185 : 2022

दूध बॉयलर — विशिष्टि

(दूसरा पुनरीक्षण)

Milk Boiler — Specification

(Second Revision)

ICS 67.250; 77.140

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Utensils, Cutlery Domestic Hardware Sectional Committee, MED 33

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Utensils, Cutlery Domestic Hardware Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first published in 1973 and revised in 1981. In this revision, the following major changes have been incorporated:

a) Stainless steel material for construction of the milk boiler has been added;
b) Grades of aluminum as per IS 21 used by the Industry has been specified; and
c) New tests have been added.

If milk is boiled in ordinary cooking vessels, there are chances of its being spilled over. The milk so boiled is subjected to uncontrolled heating. The large amount of water vapours rising through the volume of milk is prevented from escaping by the skin formation on milk. Because of the internal pressure developed, the vapours rise along with the skin in the form of bubbles. The pressure is released, if either the bubbles burst or the milk spills over the vessel whichever happens earlier. In an aluminium milk boiler of this type, the milk is subjected to indirect heating. In this case the temperature of the heating medium (water) does not exceed its boiling temperature. Also in case of milk, the boiling point is slightly higher than that of water. In view of the above reasons, the milk when heated in the water-jacketed vessel does not spill over but simmers in the vessel itself.

The relevant SI units and corresponding conversion factors are given below for guidance:

$$1\ \text{kgf/cm}^2 = 98.066\,5\ \text{kPa (kilopascal)} = 10\ \text{m of Water column (WC)}$$

$$= 0.098\,066\,5\ \text{MPa (megapascal)}$$

$$= 0.980\,665\ \text{bar}$$

$$1\ \text{Pa} = 1\ \text{N/m}^2$$

The composition of the committee responsible for the formulation of this standard is listed in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*). The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

MILK BOILER — SPECIFICATION

(Second Revision)

1 SCOPE

This standard covers minimum requirements of milk boiler.

2 REFERENCES

The standards listed below contain provisions which, through reference in this text, constitute provision of this standard. At the time of publication the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate, the possibility of applying the most recent editions of the standards.

IS No.	*Title*
IS 21 : 1992	Wrought aluminum and aluminum alloys for manufacture of utensils — Specification (*fourth revision*)
IS 737 : 2008	Wrought aluminum and aluminum alloy sheet and strip for general engineering purposes — Specification (*fourth revision*)
IS 5522 : 2014	Stainless steel sheets and strips for utensils — Specification (*third revision*)
IS 5856 : 2017	Welding consumables — Wire electrodes, strip electrodes, wires and rods for arc welding of stainless and heat resisting steels — Classification (*second revision*)
IS 5897 : 1985	Specification for aluminum and aluminum alloy welding rods and wires and magnesium alloy welding rods (*first revision*)
IS 6911 : 2017	Stainless steel plate, sheet and strip — Specification (*second revision*)
IS 13395 : 2021	Performance of handles and handle assemblies attached to cookware — Specification (*first revision*)

3 TERMINOLOGY

3.1 Milk Boiler — A double-jacketed vessel for use with external heat sources for boiling of milk.

3.2 Capacity — Liquid capacity of the inner container up to the lower portion of the lid when fitted to the container.

4 CAPACITIES

Nominal capacity of milk boilers shall be 0.5 litres to 5 litres and shall be expressed only in complete or half-litre units. No negative tolerance shall be allowed on the nominal capacity.

NOTE — If the capacity of a boiler is not in complete or half-litre unit, its nominal capacity shall be marked as the nearest lower complete or half-litre unit. For example, in case of a boiler having a capacity of 3.9 litres, the nominal capacity to be marked shall be 3.5 litres.

5 MATERIALS

5.1 The body and the lid of the boiler shall be fabricated from aluminium conforming to designation 19000, 19500 or 31000 as per IS 737 or IS 21 or 304 grade of stainless steel as per IS 5522 or 316 grade of stainless steel as per IS 6911.

5.2 Handles/Holding Lugs and Knob on the Lid

Handles/holding lugs and knob on the lid shall be made from impact-resistant and non- inflammable plastics or phenolic formaldehyde.

6 SHAPE AND DIMENSIONS

6.1 The recommended shape of the milk boiler is given in Fig. 1.

6.2 The nominal thickness of the sheet used for manufacturing of aluminium steel milk boiler shall conform to Table 1.

Table 1 Requirement for Thickness for Sheet

(*Clause* 6.2)

All dimensions in millimetres

Sl No.	Capacity of Aluminium Milk Boiler (in Litres)	Nominal Thickness of Sheet (*Min*)	
		Outer container	Inner container
(1)	(2)	(3)	(4)
i)	0.5, 1, 1.5 and 2	1.25	0.90
ii)	2.5, 3, 3.5, 4, 4.5 and 5	1.60	1.25

6.3 The nominal thickness of the sheet used for manufacturing of stainless steel milk boiler shall conform to Table 2. The permissible reduction in the thickness of the finished milk boiler, taking into account the pressing or spinning process, shall not be more than 15 percent on the minimum sheet thickness specified as per Table 2. For fabricated milk boiler, 15 percent reduction in the thickness of sheet is not applicable.

Table 2 Requirement for Thickness for Sheet

(*Clause* 6.3)

All dimensions in millimetres

Sl No.	Capacity of Stainless Steel Milk Boiler (in Litres)	Nominal Thickness of Sheet (*Min*)	
		Outer container	Inner container
(1)	(2)	(3)	(4)
i)	0.5, 1, 1.5 and 2	0.8	0.6
ii)	2.5, 3, 3.5, 4, 4.5 and 5	1.0	0.8

7 WORKMANSHIP AND FINISH

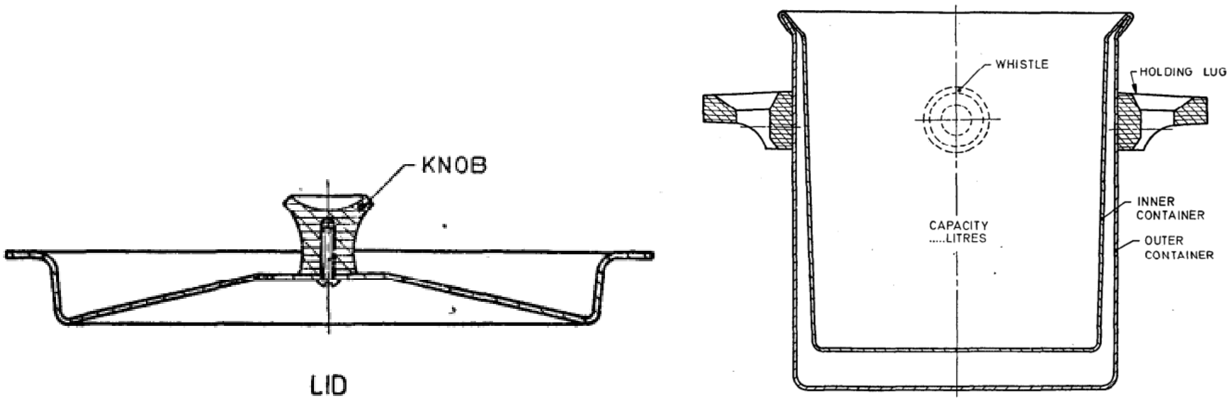
7.1 The boiler shall have no sharp edges. It shall be free from distortion, dents, wrinkles, scratches, pits, deep tool marks and other surface defects. Construction shall be such that it is possible to clean the boiler.

7.2 Inner container, outer container and lid shall each be made from a single piece of metal, seamless and without welds. The rim of the inner container shall be spun over the rim of the outer container as shown in Fig. 1 so as to be tight fitting and keep the two containers concentric. There shall be sufficient space for water between the two containers.

7.3 The outer container has a push on type or screwed whistle. The fitment shall be leak proof. The whistle normally comes with an O-ring.

NOTE — The whistle shall be removed for poring of water.

7.4 Welding if done on inner container and outer container on aluminium boiler, the weld shall be free from welding defects. The welding electrode shall conform to IS 5897. The weld shall be finished properly so that when a finger is passed on the joint, it shall be smooth. Welding if done on inner container and outer container on stainless steel boiler, the weld shall be free from welding defects. The welding electrode shall conform to grade 308 L (07Crl8Ni9) as per IS 5856. The weld shall be finished properly so that when a finger is passed on the joint, it shall be smooth.



LID

FIG. 1 MILK BOILER

8 PERFORMACE TEST

8.1 Test for Knob and Handle

8.1.1 The knob and handle shall be dropped from a height of 0.8 m on to a concrete floor or a flat stone three times in succession. The components shall not show any sign of cracking or breaking.

8.1.2 *Position of Handle and Knob with Respect to the Milk Boiler*

The handles shall be positioned above the centre of gravity of the milk boiler when filled to its gross capacity.

8.1.3 The knobs and handles shall comply with the fatigue resistance, burning resistance, heat resistance tests as specified in IS 13395.

8.2 Air Pressure Test

The space between the inner and outer container of the milk boiler shall be subjected to air pressure of 0.4 kgf/cm^2. The milk boiler shall not show any sign of leakage or deformation.

8.3 Staining Test

The surface of the boiler shall be thoroughly washed with hot soapy water. Thoroughly rinse and then degrease the test specimens in acetone or methylated spirits, then wiped using a soft cloth. The boiler, when dipped for 16 h in each of the following solutions maintained at 60 °C ± 2 °C temperature, shall not show any sign of staining after removal from the solutions at the end of above period:

a) Ten gram of glacial acetic acid (99 percent) dissolved in distilled water to make 100 ml; and
b) Five gram of pure sodium chloride dissolved in distilled water to make 100 ml.

NOTE — This test is applicable for stainless steel milk boiler.

9 MARKING

The outer container of the boiler shall be suitably marked with the material grade, manufacturer’s name, recognized trade-mark or identification mark and the capacity.

9.1 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

10 PACKING

Each milk boiler shall be suitable packaged to avoid any damage during transit. The packaging shall be eco-friendly.

Annex A

(*Foreword*)

COMMITTEE COMPOSITION

Utensils, Cutlery Domestic Hardware Sectional Committee, MED 33

Organization	*Representative(s)*
In Personal Capacity (*A-504, K.G Chandra Vista, OMR, Opposite to Satyabhama University, Sholinganallur, Chennai*)	SHRI G. SHANMUGANATHAN (***Chairperson***)
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Member Secretary
Shri Chandan Gupta
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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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